

Appl. No. 10/087,856
Amdt dated Dec. 11, 2003
Reply to Office Action of Jul. 11, 2003

Amendments to the Claims:

This listing of the claims will replace all prior versions and listings in the application.

Listing of Claims:

1. (Currently Amended) A ~~device~~ system for treatment of a patient's intervertebral disc, the disc including a nucleus pulposus bounded by an annulus fibrosus, said ~~device~~ system comprising:

a first and a second elongate probe for surgical insertion to two spaced apart treatment sites of the annulus fibrosus, each probe having a proximal portion and a distal portion,

wherein the distal portions of each probe comprises energy delivery means to concentrate delivery of ~~for delivering~~ energy between the distal portions of the probes through the annulus fibrosus adjacent and between the two treatment sites; and wherein at least one probe includes a cooling means for controlling the temperature of tissue adjacent the energy delivery means of the at least one probe in association with the delivery of energy and wherein the energy delivery means is configured to provide a form of energy selected from a group consisting of: electrical; microwave; and ultrasound energy.

2. (Canceled)

3. (Currently Amended) The ~~device~~ system as claimed in claim 2 1 wherein the energy delivery means provides electrical current at ~~the electrical current has a~~ frequency within the radio frequency range.

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4. (Currently Amended) The ~~device~~ system as claimed in claim 2 1 wherein the energy delivery means provides electrical current ~~has~~ at a frequency of at least 20 kHz.

5. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein the energy delivery means and cooling means are is operable to deliver energy sufficient to result in at least one of: increasing the temperature of the annulus fibrosus adjacent to at least one treatment site to a level sufficient to contract collagen fibers; coagulating nerve structures; coagulating granulation tissue in fissures of the annulus fibrosus; and denaturing pain causing enzymes in fissures of the annulus fibrosus.

6. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein the energy delivery means and cooling means are is operable to maintain the temperature of the annulus fibrosus at or below 42°C and the delivery of energy is sufficient to result in at least one of: modifying at least one function of a nerve structure in the annulus fibrosus; and stimulating an increase in collagen production.

7. (Currently Amended) The ~~device~~ system as claimed in claim 1 including an electrical impedance meter communicating between the distal portions of each probe.

8. (Currently Amended) The ~~device~~ system as claimed in claim 1 including an electrical impedance meter communicating between the distal portion of at least one probe and a dispersive electrode on the surface of the patient's skin.

9. (Canceled)

10. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein an external elongate portion of at least one probe includes an electrically ~~insulated sleeve~~ insulation.

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11. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein at least one probe includes active shape control means for progressively deploying the trajectory of the distal portion of the at least one probe in three-dimensional space, as the distal portion is longitudinally slidably released from an outer end of an introducer ~~tube~~.

12. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein at least one probe includes at least one temperature sensor for monitoring ~~the temperature of the at least one of probe; a portion of the annulus fibrosus immediately adjacent the probe; and a portion of the annulus fibrosus distant from the probe.~~

13. (Currently Amended) The ~~device~~ system as claimed in claim 1 wherein at least one probe includes a distal portion having a shape for directing the delivery of energy between the probes to concentrate the energy.

14. (Currently Amended) A ~~device~~ system as claimed in claim 1 further including a first and a second introducer for providing percutaneous access to an intervertebral disc, each introducer comprising an elongate hollow open tube having an inner a distal and an outer a proximal end, with a surface that is electrically insulated, the distal end having a temperature sensor, near the outer end the introducers insertable into the disc to the treatment sites and operable to receive respective first and second probes to position the energy delivery means at the treatment sites, the temperature sensor positioned at the distal end to measure temperature at a distance apart from said energy delivery means.

15. (Original) A method for treatment of an intervertebral disc, the disc including a nucleus pulposus bounded by an annulus fibrosus, said method comprising the steps

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of:

- i) inserting a first and a second intradiscal lesioning probe to respective spaced apart treatment sites for annulus fibrosus, each probe having an energy delivery means located at a distal end thereof, the distal ends being inserted to the treatment sites; and
- ii) delivering energy from an energy source through the energy delivery means to the annulus fibrosus adjacent and between the treatment sites.

16. (Original) The method as claimed in claim 15 comprising a step of measuring the impedance between the energy delivery means of the probes via an impedance monitor connected to the probes and delivering the energy in response to the measured impedance.

17. (Original) The method as claimed in claim 15 comprising a step of cooling the distal end of at least one intradiscal lesioning probe with a cooling means provided to the at least one intradiscal lesioning probe.

18. (Original) The method as claimed in claim 15 wherein the step of inserting, comprises inserting at least one of the intradiscal lesioning probes through an electrically insulated introducer tube that is inserted to one of the treatment sites.

19. (Currently Amended) An intradiscal probe for use with a second probe for treatment of a patient's intervertebral disc, the disc including a nucleus pulposus bounded by an annulus fibrosus, the probe comprising:

an elongate body for surgical insertion to a treatment site for the annulus fibrosus, the body having a proximal portion and a distal portion;

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wherein the distal portion comprises ~~energy delivery means~~ an electrode for concentrating delivery of electrical ~~for delivering~~ energy between the distal portion of the probe and a distal portion of the second probe through the annulus fibrosus; and wherein the probe includes a cooling means for controlling the temperature of tissue adjacent the electrode of the probe in association with the delivery of electrical energy.

20. (Currently Amended) An intradiscal probe for treatment of a patient's intervertebral disc, the disc including a nucleus pulposus bounded by an annulus fibrosus, the probe comprising:

an elongate body for surgical insertion to a treatment site for the annulus fibrosus, the elongate body having a proximal portion and a distal portion;

the distal portion comprising an impedance measuring means; and

an energy delivery means for delivering energy to the annulus fibrosus wherein the energy delivery means is configured to selectively deliver the energy in a desired direction and wherein the probe includes a cooling means for controlling the temperature of tissue adjacent the electrode of the probe in association with the delivery of energy.